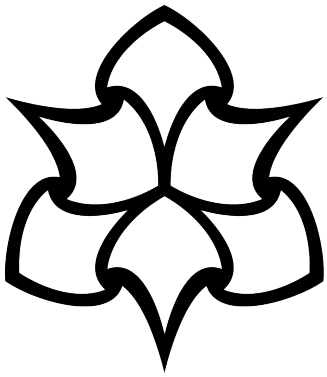

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Prosocial video game as an intimate partner violence prevention tool among youth: A randomised controlled trial

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Highlights

- The aim was to assess the effectiveness of a context-specific, prosocial video game – *Jesse*.
- The sample (N = 172) consisted of boys and girls randomly assigned to experimental and control group.
- The outcome measure consisted of affective and cognitive responsiveness (empathy) towards victims of IPV.
- A randomised controlled trial revealed a significant increase in affective responsiveness after exposure to game.

Abstract

Evidence demonstrates that exposure to prosocial video games can increase players' prosocial behaviour, prosocial thoughts, and empathic responses. Prosocial gaming has also been used to reduce gender-based violence among young people, but the use of video games to this end as well as evaluations of their effectiveness are rare. The objective of this study was to assess the effectiveness of a context-specific, prosocial video game, *Jesse*, in increasing affective and cognitive responsiveness (empathy) towards victims of intimate partner violence (IPV) among children and adolescents ($N = 172$, age range 9 – 17 years, $M = 12.27$, $SD = 2.26$). A randomised controlled trial was conducted in seven schools in Barbados. Participants were randomly assigned to an experimental (prosocial video game) or control (standard school curriculum) condition. Experimental and control group enrolled 86 participants each. Girls and boys in the experimental condition, but not their counterparts in the control condition, recorded a significant increase in affective responsiveness after intervention. This change was sustained one week after game exposure. No significant effects were recorded for cognitive responsiveness. Findings suggest that *Jesse* is a promising new IPV prevention tool among girls and boys, which can be used in educational settings.

Keywords: Prosocial video game; Intimate partner violence (IPV) prevention; Affective and cognitive responsiveness; Youth; Randomised controlled trial; Caribbean

1. Introduction

1.1 The effect of prosocial video game exposure on prosocial outcomes

Although much of the research on video gaming has focused on the negative impact of violent video games, in recent years researchers and educators have become increasingly aware of the potential benefits of prosocial/serious video games (Gentile et al., 2009; Harrington & O'Connell, 2016; Whyte et al., 2015). In such games, participants assume the roles of characters and try out new prosocial behaviours in a fictional setting (Dickey, 2006; Koo & Seider, 2010). Unlike other media which rely predominantly on the mere presentation of facts, video games scaffold children's experience using narrative and audio-visual content, as well as rules and objectives regulating players' behaviour. Appropriately designed prosocial video games can therefore be used as teaching tools, to enhance moral reasoning, prosocial cognitions, helpful behaviour, positive affect, as well as to foster empathy (Buckley & Anderson, 2006; Gentile et al., 2009; Greitemeyer & Osswald, 2009, 2010, 2011; Koo & Seider, 2010). Indeed, a growing body of empirical evidence indicates the effectiveness of experiential learning in enhancing students' meta-cognitive abilities, and their capacity to apply newly acquired skills and knowledge to real-life situations (Catalano et al., 2014).

To elucidate the effects of prosocial video games using social-cognitive and developmental approaches, Buckley and Anderson (2006) introduced the General Learning Model (GLM). According to the GLM, video games can influence three types of interrelated internal states - cognition, affect, and arousal – resulting in learning specific behaviours. In the short-term, prosocial video game content can alter players' affect, by putting them in a specific mood. Game exposure can also lower players' blood pressure and cortisol levels. At the cognitive level, a prosocial game can activate prosocial scripts stored in memory. If practiced repeatedly, short-term effects, such as prosocial actions immediately after exposure, can be translated into long-term effects, such as new perceptual and decision schemata, as well as changes in beliefs, attitudes, emotional responses, empathy, and personality structures (Gentile et al., 2009). Dietz (1998) also proposed that video games are an important element of the socialisation process, having an impact on the development of a child's identity and, subsequently, personality traits. Therefore, the content of video games to which children are exposed can have a substantial impact on their future behaviour, cognitive structures, and interpersonal relations.

In line with the tenets of the GLM, a recent meta-analytic study revealed a significant association between playing a prosocial video game and a host of positive outcomes, including

prosocial behaviour, prosocial cognitions, and prosocial affect. This effect was maintained across experimental, correlational, and longitudinal studies (Greitemeyer & Mügge, 2014). Greitemeyer and Osswald (2010), in an experimental study with German students, showed that participants who played a prosocial video game, compared with those who played a neutral or an aggressive video game, were more likely to engage in helping behaviour immediately after game exposure (experiment 1). A subsequent experiment involving two video game conditions (prosocial vs. neutral video game) revealed that participants in the prosocial condition were more likely to intervene in a staged harassment situation (experiment 3). In two other experimental studies by the same authors, playing prosocial video games resulted in an increased accessibility of prosocial thoughts (Greitemeyer & Osswald, 2011) and reduced accessibility of antisocial thoughts (Greitemeyer & Osswald, 2009) among adults.

Although the effect of video games may be especially pronounced among youth, whose personality traits and beliefs are still forming, experimental studies on the topic conducted with children are scarce. In one notable exception, Saleem, Anderson, and Gentile (2012) assigned 191 children aged from 9 to 14 years to one of three experimental conditions (violent, neutral, and prosocial). Results indicated that playing prosocial games increased helpful and decreased hurtful behaviour immediately after game exposure. The exposure to violent games had the opposite effect. Worthy of note, prosocial outcomes in Greitemeyer and Osswald's (2009, 2010, 2011) as well as Saleem et al.'s (2012) research were measured immediately after a short period of playing a game (10 minutes and 30 minutes respectively). As such, the investigations could not establish whether prosocial outcomes are sustained over a longer period of time or enhanced with longer game exposure.

Prior research has also explored the effect of prosocial gaming on empathic reactions. Using a correlational study design, Harrington and O'Connell (2016) found a significant association between prosocial video game use and empathy, cooperation and sharing, as well as positive affective relationships. By the same token, Greitemeyer, Osswald, and Brauer (2010) provided experimental evidence that playing a prosocial video game resulted in heightened interpersonal empathy. The authors also suggested that increase in empathy as a function of prosocial gaming, can subsequently lead to prosocial behaviour. Support for this has been provided by Prot et al.'s (2014) longitudinal research, which demonstrated that change in prosocial video game use significantly affected change in prosocial behaviour, and that this relationship was mediated by change in trait empathy levels. However, although empathy is conceptualised as a two-dimensional construct with affective and cognitive elements (Davis,

1983), research to date has not examined the effect of prosocial video games on the two empathy dimensions separately.

1.2 Prosocial video game interventions to combat gender-based violence (GBV)

On the basis of the above-cited findings, it appears that prosocial video games can be used to prevent specific forms of violence, such as intimate partner violence (IPV). IPV, typically defined as acts of physical violence, sexual violence, emotional abuse, and controlling behaviours, is a widespread problem affecting people of both sexes worldwide. Although many men suffer victimisation in their intimate relationships, such violence is predominantly perpetrated by men against women (World Health Organization [WHO], 2013). It is estimated that one in three women will experience IPV in their lifetime. In the WHO multi-country study among 24,000 women, it was revealed that 13-61% of respondents experienced physical violence by a partner, 4-49% reported experiences of severe physical abuse, and 6-59% admitted to having been sexually abused by a partner (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2005). In some countries, less than 40% of those women will seek help of any sort, which may be linked to the widespread acceptability of violence against women and gender-biased social norms (United Nations, 2015; WHO, 2012).

Interestingly, research evidence indicates that not all men using violence in intimate relationships resort to interpersonal violence outside the home, suggesting that the development of IPV accepting attitudes is not akin to the formation of pro-violence attitudes in general, and can be guided by unique risk factors (Anderson & Bushman, 2002; Holtzworth-Munroe & Meehan, 2004). Indeed, some findings demonstrate that violence perpetrators have reduced empathy towards their victims only, rather than global empathy levels (e.g., Fernandez & Marshall, 2003; Fernandez, Marshall, Lightbody, & O'Sullivan, 1999). Therefore, key to reducing the occurrence of IPV are innovative educational and social strategies which challenge IPV accepting norms specifically, before they become internalised (Miller, 2014; WHO, 2016). Targeting children and youth in such programmes appears crucial for transforming societies and creating a lasting change to the situation of women and men worldwide (WHO, 2012). Given the appeal of novel technologies to young people and prior research findings indicating that prosocial video games can foster empathy and pro-social behaviour (e.g., Greitemeyer et al., 2010; Harrington & O'Connell, 2016; Prot et al., 2014), technological advancements can be utilised to change the attitudes that contribute to IPV and to increase self-actualisation and empowerment.

To date, there has been a small number of prosocial game projects which address gender-based violence (GBV). For example, *BreakAway* is a role-playing soccer game educating children about violence against girls (Wang, Choi, & Wu, 2014). *Green Acres High* aims to change attitudes towards dating violence (Bowen et al., 2014). *PR:EPARe*, on the other hand, was designed to teach adolescents about coercion in their relationships (Arnab et al., 2013). Evaluations of the above-listed gaming interventions revealed positive outcomes, including attitude and behaviour change (Wang et al., 2014) and preparedness to avoid coercion (Arnab et al., 2013). However, Wang et al. (2014) did not use standardised measures to assess intervention outcomes, whereas Bowen et al. (2014) conducted only a qualitative evaluation. Although Arnab et al. (2013) employed a cluster randomised controlled trial with two experimental conditions (serious game vs. standard relationships and sex education class) among teenagers from England, participants were exposed to the intervention for one hour only. In recognising that gender-biased attitudes are deeply ingrained in some cultural settings, such a brief exposure may not be sufficient to influence affective and cognitive changes in participants recruited from world regions where GBV is rampant and socially accepted.

Additionally, there is generally a lack of serious games addressing different forms of GBV in non-Western countries and few include societal and cultural factors of importance to those specific regions during game design, demonstrating the persistent sampling bias toward WEIRD (Western, educated, industrialised, rich, and democratic) populations in developmental psychology (see Nielsen, Haun, Kärtner, & Legare, 2017). Since socialisation is driven by culture, lack of interventions created specifically for different world regions can impede IPV reduction efforts. To address this void, the None in Three (Ni3) Research Centre has recently created *Jesse* – a bespoke prosocial video game tackling IPV-accepting attitudes among children and adolescents in the Caribbean, a region where the risk of exposure to GBV is among the highest in the world (Jeremiah, Gamache, & Hegamin-Younger, 2013; Jeremiah, Quinn, & Alexis, 2017; Reid, Reddock, & Nickening, 2014). *Jesse* is a point-and-click role-playing game consisting of five levels in which players assume the role of different characters experiencing and/or perpetrating physical and emotional violence within a family context. The game is designed to affect players' empathic responses to victims of domestic violence, as well as raise the awareness of the impact of IPV (see Smith, Ma, Jones, & Unver, 2017 for the game development description).

1.3 The present study

In the present experiment, we examine the effectiveness of a context-specific, prosocial video game, *Jesse*, in increasing affective and cognitive empathy (referred to as 'affective

responsiveness' and 'cognitive responsiveness' throughout the paper) towards victims of IPV among children and adolescents (referred to as 'youth' throughout the paper) from Barbados, an Eastern Caribbean country. Since prior research reported higher emotional and cognitive empathy in girls than in boys (e.g., Bengtsson & Arvidsson, 2011; Mayberry & Espelage, 2007), as well as gender differences in the consequences of child abuse and domestic violence exposure (e.g., Asscher, Van der Put, & Stams, 2015), gender was included as one of the factors in the analysis. Additionally, in considering the high prevalence of GBV and GBV-supportive attitudes in the Caribbean region (Jeremiah et al., 2013, 2017; Reid et al., 2014), game exposure in the current study lasted for five days. Based on the tenets of the GLM, we hypothesised that exposure to the misfortune of a woman suffering from physical and emotional abuse by a partner (as depicted in the game), would lead to increased cognitive and affective empathic reactions toward IPV victims immediately after completing the game. We also hypothesised that this effect would be sustained one week after the end of the intervention.

2. Methods

2.1 Sample

The sample included children and adolescents (N = 172, age range 9 – 17 years, M = 12.27, SD = 2.26) from three primary schools (n = 75), two secondary schools (n = 62) and two Government Industrial Schools (n = 35) located in Barbados. Primary education in Barbados begins at age 4 and continues until age 11. Secondary education is provided for children aged 11 to 18 years. Government Industrial Schools are for young offenders whose offences range from assault, breach of probation, burglary, causing a public disturbance, possession of a controlled substance such as cannabis, possession of an offensive weapon, serious bodily harm, theft, and wandering. The sample consisted of 83 females and 89 males. Most of the participants were from the rural areas of the island (n = 132).

2.2 Design and procedure

Permission for conducting the study was granted by the Ministry of Education, Science, Technology, and Innovation in Barbados. Scientific approval for the project was granted by the University of (name blinded for review) Ethical Board. The study was designed and conducted in line with the British Psychological Society (BPS) Code of Ethics and Conduct.

Schools were randomly selected from a pool of primary, secondary, and government industrial schools in Barbados. Once the schools had confirmed their participation, they were provided with information letters about the project to forward to parents or legal guardians in

order to obtain consent for their child's participation in the study. Parents/legal guardians who did not want their children to participate were given the opportunity to withdraw them from the study. Additionally, all participating youth were provided with a participant information sheet and student consent form before they decided whether or not to participate in the study.

A two (group: experimental and control) by two (gender: boys and girls) by three (data collection time: baseline, after game intervention, seven-day follow up) experimental design was used to test prosocial game effectiveness. The outcome variables were affective and cognitive responsiveness to victims of IPV (see instruments section). A randomised controlled trial was carried out. Each participant had an equal chance of being assigned to the experimental (n = 86, youth exposed to game intervention) or control (n = 86, youth exposed to standard school curriculum) group. Participants in the experimental group played the game on a PC in the school computer labs for five days (one game level per day takes 45 minutes). The data on affective and cognitive responsiveness towards victims of IPV were collected before the game intervention (Time 1; day one, Monday morning), immediately after game intervention (Time 2; day five, Friday afternoon), and seven days after the intervention (Time 3; day twelve, Friday afternoon). All participants were debriefed upon completion of the project. After the study, the game was made freely available to all participating schools.

2.3 Instruments

2.3.1 Game

Jesse is a prosocial video game which intends to increase affective and cognitive responsiveness towards victims of gender-based violence in domestic context. The full description of game development is provided in Smith et al. (2017). The game features a number of gameplay systems that have been designed to allow the player to role-play as a variety of characters in various scenarios. These were drawn from qualitative research on domestic violence carried out by the project team with 109 adults (female = 49, male = 60) (Jones et al., 2017). Prominent themes from the qualitative research integrated into game design included: gender inequality, female economic dependency, intergenerational violence, the impact on primary and secondary victims, the physical and emotional impact of domestic violence and escalatory patterns, help-seeking behaviour and empowerment-based interventions, the role of alcohol as a contributory factor, impact on children's behaviour, the role of professionals, positive male role models as agents of change, and perpetrator accountability.

An important element of *Jesse*'s development has been socio-cultural sensitisation to Caribbean context, through consultation with groups of young people in Barbados, input from Caribbean experts and the inclusion of real world information, local dialects, voices and characterisations. The game consists of five levels (see Figure 1). Level 1 is an introduction to the main characters in the game, including the main player character - a young schoolboy named Jesse, Jesse's mother (Diana), and Diana's partner (Rondell) who is the IPV perpetrator. Level 2 takes place in hospital, where Diana was admitted after her partner had physically abused her. Level 3 is placed in Jesse's school. As Jesse's teacher (George), players must ask Jesse questions and attempt to discover why Jesse's behaviour and grades are suffering. Level 4 features Rondell with his best friend (Hayden) having a conversation about Rondell's violent behaviour toward Diana. In level 5, players are given a choice to determine the outcome of the story.

Figure 1. Screenshot showing the main character Jessie and 5 levels of the game.

2.3.2 Outcome measure

None in Three Victim Responsiveness Assessment (Ni3: VRA; Debowska, Boduszek, Willmott, & Jones, under review) is a measure of affective and cognitive responsiveness to victims of intimate partner violence (IPV). The scale is composed of 16 items indexed on a five-point Likert scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*). The Ni3: VRA consists of two subscales: affective responsiveness

(eight items, Cronbach's alpha = 0.85) and cognitive responsiveness (eight items, Cronbach's alpha = 0.82). Sample items include "I get upset when I see a woman being physically hurt by her partner" (affective responsiveness) and "I would find it easy to imagine how a woman might feel while she is shouted at or called names by her partner" (cognitive responsiveness). All scale items are presented in the appendix. Scores on the total scale range from 16 to 80, whereas subscale scores range from 8 to 40. Higher scores indicate greater affective and cognitive responsiveness to victims of IPV.

3. Results

3.1 Affective responsiveness towards victims of IPV

A 2 (group: experimental and control) x 2 (gender: boys and girls) x 3 (time: baseline, Time 2, Time 3) mixed between-within subjects ANOVA was conducted to assess the change in affective responsiveness towards victims of IPV. Means and standard deviations are presented in Table 1. The main effect for group was statistically non-significant (F [1, 167] = 0.69, $p = 0.41$) but statistically significant for gender (F [1, 167] = 8.62, $p = 0.004$, partial η^2 = 0.049; with females scoring higher). There was a statistically significant change for time (Wilks' Lambda = 0.89, F [2, 166] = 10.78, $p < 0.001$, partial $\eta^2 = 0.12$).

There was no significant interaction between group, gender, and change over time (Wilks' Lambda = 0.98, F [2, 166] = 1.80, $p = 0.17$) and between gender and change over time (Wilks' Lambda = 0.99, F [2, 166] = 0.47, $p = 0.63$). However, there was a significant interaction between group and change over time (Wilks' Lambda = 0.83, F [2, 166] = 16.96, $p < 0.001$, partial $\eta^2 = 0.17$). The graphical presentation of the pattern of change in affective responsiveness mean values is illustrated in Figure 2.

Given the above results, further analyses were performed separately for the experimental and control group (Bonferroni correction applied). Experimental group (Wilks' Lambda = 0.60, F [2, 83] = 27.99, $p < 0.001$, partial $\eta^2 = 0.40$) reported statistically significant increase in affective responsiveness from Time 1 to Time 2 (Cohen's $d = 0.56$, $p < 0.001$) and this change was sustained in Time 3 ($p = 0.46$). The change over time was not statistically significant for the control group (Wilks' Lambda = 0.99, F [2, 84] = 0.56, $p = 0.58$)

Table 1. *Means (SDs) for Affective Responsiveness towards Victims of IPV for Experimental and Control Group over Three Time Points*

	Time 1		Time 2		Time 3	
	Control	Experimental	Control	Experimental	Control	Experimental
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Males	30.25 (5.97)	29.05 (6.41)	29.38 (7.40)	32.32 (6.35)	30.10 (6.51)	31.17 (5.36)
Females	32.59 (5.76)	31.07 (5.42)	32.84 (5.99)	34.25 (4.34)	31.76 (6.01)	33.82 (5.65)
Full sample	31.37 (6.00)	30.09 (5.97)	30.99 (7.03)	33.32 (5.46)	30.93 (6.35)	32.54 (5.42)

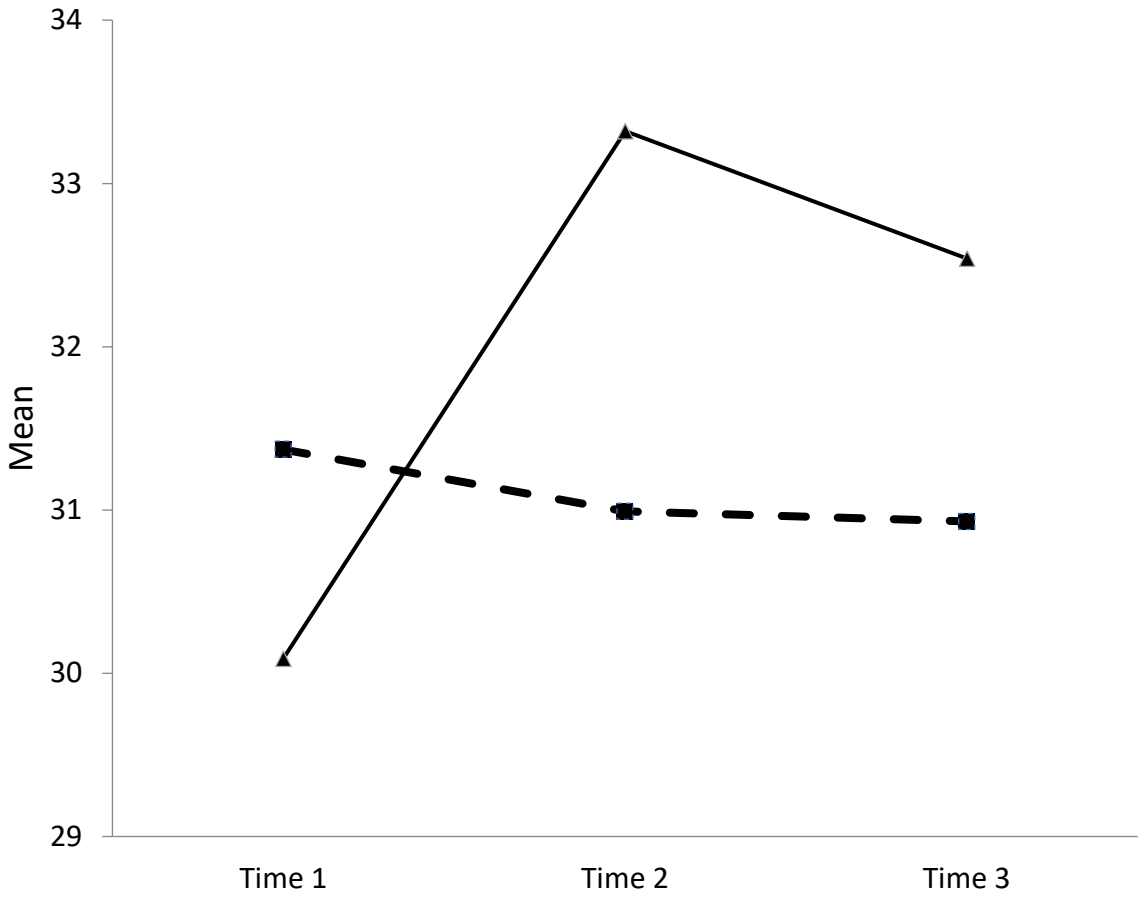

Figure 2. Changes in the mean levels of affective responsiveness in control and experimental conditions. Solid Line = experimental group; dashed line = control group.

3.2 Cognitive responsiveness towards victims of IPV

Similarly, a 2 x 2 x 3 mixed between-within subjects ANOVA was conducted to assess the change in cognitive responsiveness towards victims of IPV. Means and standard deviations are presented in Table 2. The main effect for group (F [1, 167] = 2.85, p = 0.09) and condition (F [1, 167] = 0.10, p = 0.76) was statistically non-significant. No statistically significant change for time was observed (Wilks' Lambda = 0.98, F [2, 166] = 1.68, p = 0.19).

There was no significant interaction between group, gender, and change over time (Wilks' Lambda = 0.99, F [2, 166] = 0.36, p = 0.70), between gender and change over time (Wilks' Lambda = 0.99, F [2, 166] = 0.40, p = 0.67), and between group and change over time (Wilks' Lambda = 1.00, F [2, 166] = 0.02, p = .98).

Table 2. *Means (SDs) for Cognitive Responsiveness towards Victims of IPV for Experimental and Control Group over Three Time Points*

	Time 1		Time 2		Time 3	
	Control	Experimental	Control	Experimental	Control	Experimental
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Males	28.27 (7.04)	28.73 (6.02)	29.04 (7.51)	28.85 (7.85)	28.88 (7.85)	29.34 (7.17)
Females	29.49 (5.47)	29.77 (6.21)	30.32 (5.77)	31.27 (6.72)	30.14 (5.33)	30.68 (7.63)
Full sample	28.93 (6.47)	29.27 (6.11)	29.72 (6.85)	30.11 (7.34)	29.55 (6.92)	30.03 (7.40)

4. Discussion

Prior research has indicated that prosocial gaming can increase players' prosocial behaviour (e.g., Greitemeyer & Osswald, 2010; Saleem et al., 2012), prosocial thoughts (e.g., Greitemeyer & Osswald, 2011), and empathic responses (e.g., Greitemeyer et al., 2009, 2010; Harrington & O'Connell, 2016). Although there have been some successful trials showing that prosocial video games can be used as a GBV reduction tool among youth (see Arnab et al., 2013; Bowen et al., 2014; Wang et al., 2014), such research is rare and there is a lack of bespoke gaming interventions aimed at youth from non-Western countries. In the present study, we tested the efficacy of *Jesse* – a prosocial video game designed by a cross-disciplinary team of researchers from the None in Three (Ni3) Research Centre specifically for youth in the Caribbean region – in increasing players' affective and cognitive responsiveness towards female victims of IPV. Game effectiveness evaluation was conducted in school settings using a randomised controlled trial. Overall, results indicate that *Jesse* is a promising IPV prevention tool among girls and boys from Barbados.

4.1 Discussion of findings

In line with the assumption of the General Learning Model (GLM; Buckley & Anderson, 2006) that exposure to prosocial video games can alter players' affective reactions as well as empirical research findings suggesting that prosocial game use increases empathic responses (Greitemeyer et al., 2010; Harrington & O'Connell, 2016), we hypothesised that *Jesse* would impact players' affective responsiveness. The current data support this prediction. More specifically, girls and boys in the experimental condition, but not their counterparts in the control condition, revealed heightened affective responsiveness towards victims of IPV at the end of intervention. There was no significant change in affective responsiveness between two post-intervention time points in participants from the experimental condition, providing the first experimental evidence that the change in this psychological construct as a function of prosocial gaming can be sustained over a longer period of time. Of importance, our study was also the first in the field to assess victim specific empathy, i.e., a cognitive and emotional understanding of the experience of victims, as opposed to global empathy, i.e., general reactions to the experience of others (Mann & Barnett, 2013). This decision was motivated by prior research findings suggesting that violence perpetrators have reduced empathy towards their victims, while their global empathy levels remain unaffected (e.g., Fernandez & Marshall, 2003; Fernandez et al., 1999). In light of this evidence, it appears that IPV reduction efforts should be directed at enhancing context-specific empathy. *Jesse* is the first IPV prevention tool

in the Caribbean whose efficacy in improving affective responsiveness towards victims of such violence has been empirically demonstrated.

The hypothesis that exposure to *Jesse* would increase youth's cognitive responsiveness to IPV victims at the end of intervention and that this change would be sustained one week after the intervention was unsupported by the current data. We propose two possible explanations of this result. First, the GLM indicates that prosocial video games can have a long-term effect on players' cognitive structures and empathy levels. We found that as long as changes in affective responsiveness can be detected immediately after game exposure and in a one-week follow-up, changes in cognitive responsiveness levels appear to require a longer consolidation period. Support for this supposition comes from functional brain imaging research, indicating that affective and cognitive empathy are neurally distinct (e.g., Cox et al., 2012), and hence their development may be guided by different processes. To evaluate this possibility, future game evaluation research using victim responsiveness as an outcome measure, should include an additional post-intervention data collection point. Second, a more intensive interventive strategy may be required to produce change in cognitive responsiveness. We therefore suggest the inclusion of a second experimental condition in future studies, where playing the game would be followed by a structured group discussion facilitated by a teacher/researcher. We anticipate that such an approach would give youth an opportunity for more extensive cognitive processing of information contained in the game, and hence allow for a swifter change in cognitive responsiveness toward victims of IPV.

Although the discrepancy in the effect of prosocial gaming on cognitive and affective responsiveness was contrary to what was predicted, it can be explained in light of prior theory and research. Specifically, affective and cognitive empathy are understood as complementary, yet two independent systems. It has been suggested that the separability between cognitive and affective empathy is more pronounced in males than in females. The distinct nature of the two systems can be exemplified by empathy imbalance disorders, where one type of empathy is lowered, while the levels of the other type remain intact, such as autism (low cognitive empathy) and psychopathy (low affective empathy) (see Smith, 2006 for a theoretical elaboration). Affective and cognitive responsiveness were also demonstrated to differentially correlate with external criteria (e.g., Boduszek, Debowska, Dhingra, & DeLisi, 2016), further corroborating that the two are separate constructs with different consequences. Therefore, although *Jesse* induced changes in affective but not cognitive responsiveness, an increase in the affective system alone may be sufficient to produce positive changes in children's behaviour, even before they are able to understand the situation of women abused by their

partners. Indeed, Stephan and Finlay (1999) indicated that emotional empathy may be more effective in increasing prosocial behaviour, whereas cognitive empathy can lead to greater understanding of outgroup members.

4.2 Limitations

This research did not include a measure of participants' behaviour and hence we cannot establish whether changes in affective responsiveness translate into behavioural change. However, given our focus on victim specific responsiveness, it was deemed that a parallel behavioural measure assessing IPV perpetration would not be appropriate for the young participants in the study. It is recommended that future research with older youths who could have already engaged in dating relationships employs a relevant behavioural measure to explore the nature and direction of associations between affective responsiveness, cognitive responsiveness, and prosocial behaviour.

4.3 Practical implications

Notwithstanding, the current study has important research and practical implications. To the best of our knowledge, this is the first school-based evaluation of the effectiveness of a prosocial game intervention in changing youth's affective and cognitive responsiveness using a standardised outcome measure and a week-long game exposure. Additionally, past research did not differentiate between affective and cognitive empathy or utilise a victim specific empathy measure. As such, the current research is the first to demonstrate that changes in affective responsiveness toward IPV victims are detectable immediately after game exposure and sustained after one week, whereas changes in cognitive responsiveness may require a longer period of processing time or a more intensive exposure. The present study also addresses the need for more research data obtained from non-Western populations of youth (see Nielsen et al., 2017). As for practical implications, *Jesse* is a bespoke video game designed specifically for youth in the Caribbean, making it the first IPV prevention tool of its kind in the region. Furthermore, addressing themes such as gender inequality, intergenerational abuse, alcohol abuse as a contributing factor, the impact of IPV and the positive roles males can play in addressing male-perpetrated violence, game content provides opportunities for increasing knowledge and non-adversarial conflict resolution skills that may be more widely beneficial. Whilst these facets of the game were not evaluated in the current study, the persuasive game strategy has potential not only as a young person-centred approach to building empathy, but also in raising awareness about the multi-faceted nature of IPV and the contexts in which it emerges.

The game has been recommended for inclusion in the national school curricula in Barbados and Grenada and has been utilised as an awareness-raising and empowerment intervention for girls in a Caribbean Juvenile Detention Centre. There is also an on-going implementation of *Jesse* in schools in Saint Lucia undertaken by educators in the country with the assistance of researchers from the Ni3 Research Centre. Given the success of *Jesse*, the Ni3 Research Centre, supported by funding from UK Research and Innovation, is currently developing culture-sensitive prosocial video games for different world regions to address some of the most prevalent and detrimental expressions of GBV (such as child marriage and child sexual exploitation).

4.4 Conclusion

In sum, using a randomised controlled trial conducted in naturalistic settings, the current study tested the effectiveness of a prosocial video game, *Jesse*, in changing Barbadian youth's affective and cognitive responsiveness towards victims of IPV. The findings indicate that youth in the experimental condition, but not youth in the control condition, scored higher on affective responsiveness towards victims of IPV after the intervention and this change was sustained in a one-week follow-up. Contrary to our initial prediction, game exposure did not affect participants' cognitive responsiveness towards IPV victims, pointing to differential formation processes of cognitive and affective responsiveness among youth.

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Appendix

None in Three Victim Responsiveness Assessment (Ni3: VRA) is a measure of affective (items 1-8) and cognitive (9-16) responsiveness to victims of intimate partner violence (IPV).

Instructions: Please tell us to what extent you agree or disagree with the statements below.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. It makes me feel sad to see a woman who is physically hurt (e.g., hit/beaten/pushed/punched) by her partner.					
2. I get upset when I see a woman being physically hurt by her partner.					
3. Seeing a woman who was hurt by her partner crying, makes me feel like crying too.					
4. When I see a woman suffering after she was hit by her partner, I feel bad.					
5. I feel sorry for women who are physically hurt by their partners.					
6. When I see a woman being shouted at, threatened or called names by her partner, I feel sorry for her.					
7. I get upset when I see a woman being called names or threatened by her partner.					
8. Sometimes I cry when I see a woman being hurt by her partner.					
9. I can understand how a woman who was physically hurt by her partner is feeling.					
10. I can imagine what a woman physically hurt by her partner is thinking.					
11. I can tell what a woman beaten by her partner feels by the look on her face.					
12. I find it easy to imagine how a woman might feel while she is shouted at or called names by her partner.					
13. I can understand how difficult it might be for a woman to live with an aggressive partner.					
14. I can tell what a woman hurt by her partner feels even when she is masking her true emotion.					
15. I find it easy to recognise emotions that a woman hurt by her partner might feel.					
16. I can tell how a woman hurt by her partner is feeling by listening to the tone of her voice.					